Light and Lighting

Official Journal of the Illuminating Engineering Society

Incorporating "The Illuminating Engineer."

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	Page
Editorial Notes ...	169
Notes and News ...	170
I.E.S. Meetings... ...	171
I.E.S. Presidential Address	173
The Editor Replies	175-6
A New Arc Lamp ...	177
A.P.L.E. Conference ...	179
Fluorescent Street Lighting	185

A New Chapter

ON October 1, when Mr J. S. Dow became President of the I.E.S., a new chapter in the history of the Society began.

It will be recalled that the founder of the Society, Mr Leon Gaster, acted as Honorary Secretary from the inception of the Society in 1909 up to his death in 1928, Mr. Dow throughout this period acting as Assistant Honorary Secretary—the First Chapter.

From 1928 onwards, Mr Dow became Honorary Secretary. The fruit of early effort was then gathered and the Society has since made great and steady progress, in membership, financial position and prestige —the Second Chapter.

Now at length the secretaryship changes hands once more and a Third Chapter commences. This exchange of positions by President and Honorary Secretary is certainly unusual. Has it ever happened before in a scientific and technical Society of note?

We cannot say. One thing is certain. The Society is exceedingly fortunate in finding, in Mr Weston, a man of independent position, wide knowledge and notable achievement in research, to carry the torch.

He has the good wishes of every I.E.S. member.

I.E.S. Opening Meeting

The I.E.S. opening sessional meeting on October 8 was a notable one. The Presidential address (see pp. 173-4), was delivered by Mr. J. S. Dow, who is vacating the position of honorary secretary of the society, which he has held for so many years, and is being succeeded by Mr. H. C. Weston (his predecessor in the presidential chair). In dealing with the outlook and functions of the society, Mr. Dow stressed the importance of the human element, the need for enlisting the help of the user of light as well as the aid of other experts, and the wisdom of recognising that codes and rules have their limitations and cannot give expression to many qualities of lighting which we enjoy and value. The vote of thanks for the address was moved by Dr. J. W. T. Walsh and Mr. A. Cunnington, both of whom, besides complimenting the author on his address, referred in appreciatory terms to Mr. Dow's long service as honorary secretary of the society and as editor of *Light and Lighting*. After his induction as President, Mr. Dow reminded those present of Mr. Weston's invaluable work on the relation between lighting conditions and performance, which formed the background to the present I.E.S. Code. The interchange of the positions of president and honorary secretary was certainly unusual, but the society, in this as in other matters, must shape its own course and develop in its own way. It was exceedingly fortunate to be able to count upon the services of Mr. Weston at this juncture.

Award of Leon Gaster Memorial Premium

In view of the fact that no award was made in 1944, it was decided to grant two premiums in respect of the past session. At the I.E.S. opening meeting it was announced that Dr. J. N. Aldington and Mr. G. T. Winch were both so honoured, the former for his paper on "Bright Light Sources," the latter for his paper on "The Photometry and Colorimetry of Fluorescent and other Discharge Lamps." The awards were notable in two respects. This is the first occasion on which *two* awards have been made in a single year—an indication that both contributions were judged to be of outstanding merit. It is also the first occasion on which the award has been won by any author for a second time. This distinction also has been gained simultaneously by Dr. Aldington and Mr. Winch.

Forthcoming I.E.S. Meetings

(Provisional List)

SESSIONAL MEETINGS IN LONDON

1946.

Nov. 6th. MR. E. H. PENWARDEN and MR. S. ANDERSON on **New Light in Old Buildings.** (*Joint meeting with the R.I.B.A. At the R.I.B.A., 66, Portland Place, London, W.*1.) **6 p.m.**

Dec. 10th. MR. A. CUNNINGTON and MR. G. W. GOLDS on **Railway Lighting. Some Lessons from Experience and Views on the Future.** (*At the E.L.M.A. Lighting Service Bureau, 2 Savoy Hill, London, W.C.*2.) **6 p.m.**

MEETINGS OF CENTRES AND GROUPS

1946.

Oct. 24th. MR. A. W. GOSTT on **Lighting for Flying.** (*At the Electricity Offices, Sunbridge Road, Bradford.*) **7.30 p.m.**

Nov. 1st. Civic Luncheon and Exhibition. 1 p.m.–6 p.m. Address by the President (MR. J. S. DOW). (*At the Grand Hotel, Bristol.*) **7.30 p.m.**

Nov. 1st. DR. E. C. WALTON on **Power Factor and the Lighting Engineer.** (*In the lecture theatre of the City of Nottingham Gas Dept., Parliament Street, Nottingham.*) **5.30 p.m.**

Nov. 4th. MR. S. D. LAY on **Impressions of a Lighting Engineer in Industry.** (*At the Electricity Showrooms, The Headrow, Leeds.*) **6 p.m.**

Nov. 5th. MR. W. T. F. SOUTER on **Church Lighting.** (*At the Electricity Showrooms, Market Street, Huddersfield.*) **7 p.m.**

Nov. 6th. MR. A. W. GOSTT on **Day-Night Flying.** (*At the Cardiff Corporation Demonstration Theatre.*) **6.30 p.m.**

Nov. 6th. MR. H. W. CUMMING on **The High Brightness Mercury Vapour Discharge Lamp.** (*At the Minor Durant Hall, Oxford Street, Newcastle-on-Tyne.*) **6.15 p.m.**

1946.

Nov. 7th. MR. T. O. FREETH on **Light and Interior Decoration.** (*At the Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, C.*3.) **6 p.m.**

Nov. 7th. MR. W. CHARD on **The Cavalcade of Gas.** (*At Gloucester.*)

Nov. 8th. MR. T. O. FREETH on **Light and Interior Decoration.** (*At the Heriot-Watt College, Chambers Street, Edinburgh,* 1.) **6.30 p.m.**

Nov. 12th. Lighting in Mines. (*At the Electricity Dept., Demonstration Theatre, Charles Street, Leicester.*) **6.30 p.m.**

Nov. 14th. MR. R. O. ACKERLEY and MR. ALISTER MACDONALD on **The Place of Science in the Art of Lighting.** (*Joint meeting with the Manchester Society of Architects. At the Reynolds Hall, College of Technology, Sackville Street, Manchester.*) **6 p.m.**

Nov. 19th. MR. T. O. FREETH on **Light and Interior Decoration.** (*At the Electricity Showrooms, Whitechapel, Liverpool.*) **6 p.m.**

Nov. 21st. MR. A. G. SMITH on **Industrial Lighting; Design of Fittings and Planning of Installations.** (*At the Electricity Offices, Sunbridge Road, Bradford.*) **7.30 p.m.**

Nov. 22nd. MR. G. A. JONES on **Lighting for Photography.** (*At the Imperial Hotel, Temple Street, Birmingham.*) **6 p.m.**

Dec. 2nd. MR. W. J. G. DAVEY on **"Nomograms."** (*At the Sheffield University, Western Bank, Sheffield.*) **6 p.m.**

Dec. 3rd. MR. L. G. APPLEBEE on **Coloured and Directional Light as Applied to the Theatre.** (*At Cheltenham Town Hall.*) **7 p.m.**

Dec. 3rd. MR. W. J. G. DAVEY on **Short Cuts in Illuminating Engineering—Latest Developments.** (*At the Electricity Showrooms, Market Street, Huddersfield.*) **7 p.m.**

(Secretaries of Centres and Groups are requested to send in particulars of any changes in programmes, mentioning subject, author, place, date and time of meeting; summaries of proceedings at meetings (which should not exceed about 250–500 words) and any other local news are also welcome.)

Programmes of I.E.S. Meetings

The provisional list of I.E.S. meetings, published in the last issue of the Transactions, is an impressive one. Although, by the date of publication, returns had not yet been made by several groups, over 120 events were listed—probably a record in the annals of the society. Centres have been diligent in getting out their own lists—we have before us those of the Centres in Birmingham, Cardiff, and Nottingham. All are in the pocket folder form, giving particulars of officers and committee for the session, as well as particulars of meetings. In this respect it seems that some of the Centres are a little ahead of Headquarters which publishes a complete list of events and duly records the names of officers, etc., in the Transactions, but does not as yet embody such data in a pocket folder. This is an idea that might quite well be considered in the future.

New I.E.S. Secretary

In addition to the fact that the I.E.S. has now a new honorary secretary, Mr. H. C. Weston, members will be interested to note a change on the staff owing to the resignation of Mr. Raymond Pye who, after terminating a period of one year as secretary, has taken up a responsible position elsewhere. Members will join us in wishing him every success in his new work. The Council has now appointed Mr. G. F. Cole as assistant secretary, and he and Miss G. Wright (Mrs. Armsworth), who holds the position of accountant, will be responsible for all matters of detail under Mr. Weston. Mr. Cole, one of the younger members of the society, started his career in the service of the South Suburban Gas Company, afterwards taking up a position in the Ministry of Transport. During the war he was responsible for technical work in connection with searchlights and other electrical apparatus, and thus brings to his duties considerable experience in different fields of illuminating engineering. Members may rest assured that there will be no loss in efficiency under the new conditions, though the problem of securing adequate additions to the junior staff—a problem with which many organisations are only too familiar at the present time—has not yet been completely solved, and allowances for this difficulty should be made.

E.L.M.A. Design Courses

As we go to press we receive particulars of three forthcoming Illumination Design Courses, which are being organised by the E.L.M.A. Lighting Service Bureau (2, Savoy-hill, London, W.C.2). Two of these, the forty-fifth evening course from November 7 to December 12, and the forty-sixth day course, from November 19 to November 22, are open to all. The remaining forty-fourth day course, occupying October 29 to November 1, is intended for the supply interests. The forty-fifth course consists of six weekly lectures on successive Thursdays, at 7 p.m. The subjects of the lectures are as follows:—

Nov. 7: The Fundamental Principles of Lighting (E. B. Sawyer).
Nov. 14: The Development of Modern Lighting Practice (A. D. S. Atkinson).
Nov. 21: Illumination Design for Interiors (C. J. King).
Nov. 28: Fluorescent Lamps (C. R. Bicknell).
Dec. 5: The Decorative Possibilities of Lighting (T. C. Freeth).
Dec. 12: Lighting Applied to Production (W. Robinson).

The forty-sixth course consists of over two dozen items—certainly a comprehensive programme for four days. Fuller particulars are available from the Bureau.

I.E.S. Presidential Address

In what follows we give a summary of the Address delivered by the President, Mr J. S. Dow, at the Opening Meeting of the Illuminating Engineering Society on October 8.

In opening his address, Mr. Dow recalled that given by one of his predecessors, Mr. E. Stroud, who had dealt very ably with the progress and development of the I.E.S. since its foundation,* and had portrayed the conditions when the Society was formed in 1909—when experts were few and information scanty.

The fact that lighting is of moment to every member of the community places illuminating engineering in a special category amongst arts and sciences, and the human element is of great importance in this field.

The Illuminating Engineering Society imposes on its members a double duty. The very first of its objects, stated in its Memorandum of Association, is:—

> "to promote the general advancement of illuminating engineering and the utilisation of natural and artificial light, *and* the dissemination of knowledge relating thereto."

Achievement of this aim involves constant contact with users, from whom much can be learned. Patience must, however, be exercised in order to overcome prejudices and misconceptions. Parsimony in expenditure on lighting is in part an echo of early propaganda by advocates of gas and electric lighting, when reduction in the lighting bill was offered as main incentive. Mistrust of novelties is of old origin. Mr. Dow quoted, as a parallel case, a passage from Trevelyan's "English Social History," complaining of the introduction of chimneys, and the consequent loss of the smoky atmosphere in rooms, alleged to be of benefit to the preservation of the furniture and the health of the occupants. Critics of new illuminants have sometimes complained of the "whiter" colour of the light and commended the warmer mellow hues of lights of the past; on the other hand, some have stressed unduly the imitation of daylight as a desirable objective.

* Trans. Illum. Engg. Soc. (London). P. 159, Vol. IX., No. 9, Oct., 1944.

The Case for Good Lighting

The influence of good lighting on production, safety, cleanliness, etc., and as an amenity in daily life is generally accepted. Data are available illustrating the greater ease of vision and better performance resulting from improvements in the level of illumination. But we are on less certain ground in regard to statistical data. It is, for example, most difficult to obtain direct evidence of the value of good lighting in diminishing accidents, and in dealing with industrial and street lighting we have therefore to rely on "inferential" methods, based on comparison of data obtained during periods of daylight and darkness. In this connection two slides were shown illustrating the great rise in the proportion of street accidents occurring at night during the black-out, and showing the comparative freedom from accidents on nights when there was a full moon. Statements with regard to the effect of lighting on eyesight should, however, be accepted with reserve. Although continuous work by inadequate lighting must lead to increased effort and must therefore contribute to strain it is most difficult to get positive evidence of deterioration in eyesight due to this cause.

The Appraisal of "Quality"

Of great importance is the basis of appraisal of "quality" of lighting. In the early days of illuminating engineering there was a natural tendency to concentrate attention on the value of illumination provided. The latest I.E.S. Code, however, introduces clauses de-

fining quality (absence of glare, etc.). The element of contrast, as exemplified in the familiar diagram due to Lythgoe is of vital importance. From this diagram we conclude that for the best perception of light and shade the background brightness should be about one quarter of that of the object viewed. In no case should it be *greater*. The showing of films in complete darkness is mentioned as an undesirable departure from this diagram.

Naturally, however, this rule does not apply invariably. If we are only concerned with "outline" or "silhouette" a background brightness very much greater than that of the object may be advantageous. Exceptionally high contrasts may also be used to arrest attention. Even in lighting installations we should not be too dogmatic in limiting brightness—many people prefer a mild degree of sparkle. Extreme preoccupation with avoidance of glare may result in installations that are definitely dull.

Whilst rules are of great value in preventing abuses of light no code can express completely the conditions necessary to secure "fitness" in an installation nor can they convey all we desire from lighting. Especially is this true of natural lighting. A statement of the daylight factor, however useful, tells us nothing of the charm of daylight. Similarly, with artificial lighting, observance of rules may not in itself suffice to ensure that conditions are pleasing and in accordance with the tastes of the user. This aspect of lighting, which is associated with the *art* rather than the science of illumination, has been somewhat neglected by the Society. Firms in the lighting industry take pride in describing themselves as pioneers of scientific illumination. But they rarely profess to provide lighting that gives pleasure to the eye.

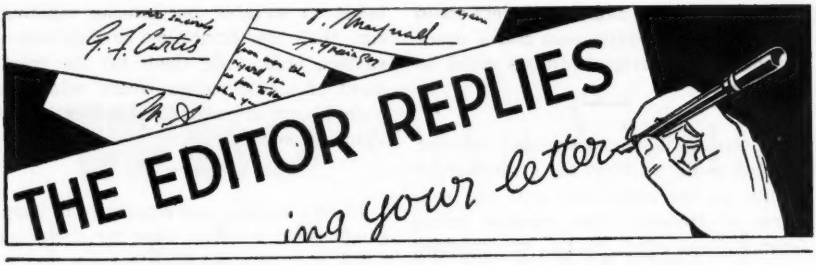
The appeal of light may play a more important part in the future. It has been remarked that the primitive lamps of the dark ages, which in efficiency remained much the same for centuries, were often objects of great beauty. Will the same be said by posterity of our lamps of to-day?

The Future of the Society

In the concluding portion of his address, Mr. Dow dealt with the future of the Society urging that every chance should be taken of enlisting the help of men of light and leading in kindred professions, and co-operating with other bodies on joint committees.

The Society, by the terms of its Articles and the intentions of its founders was a "cultural" one—the highest description that a Society could covet. This did not, however, debar the Society from making provision for training and education. The provision of some hallmark by which those with competent knowledge of illuminating engineering could be recognised and identified was a question of considerable importance.

One element which, more than any other, had contributed to the high reputation of the Society was its *disinterestedness*. This was due to the fact that the Society included amongst its members not only the greatest experts on illumination, but also others—architects, consulting engineers, physicians, teachers, works managers, and others, who all made their influence felt. This, however, was only part of the story. Even more important was the fine tradition whereby those in the lighting industry, who still formed the backbone of the Society's membership, were willing to forget their personal interests and to pool their efforts for the common good. The Society would do well to preserve its existing fabric, which had contributed to this reputation, continuing to exercise functions not unlike those of the Royal Horticultural Society which likewise aims at bringing in contact the user and the producer.



The announcement, reported in our last issue (September, 1946, p. 154) that the **Ministry of Transport** is assuming responsibility for **street lighting,** has naturally attracted attention, and the statement of the Minister at the A.P.L.E. Conference this month was heard with great interest.

Most of those with whom I have discussed the matter agree that some such step was inevitable, and that its effect must eventually prove benèficial in smoothing out administrative difficulties and bringing about greater uniformity of treatment.

One service the Department should presently be able to render, i.e., the **giving of advice** to the many authorities who have not competent lighting engineers of their own. One can visualise, for example, the creation of a central advisory bureau aided by experts, and even the equipment of some **central demonstration area** where the latest method of public lighting can be shown and experiments tried out.

My attention has been drawn to the prediction, in the Press, that **floodlighted league football** is likely to become a regular thing in the near future. In the United States football and baseball are frequently played at night in floodlighted stadiums. One can understand the incentive to managers of clubs, well aware of the public demand for evening entertainment and anxious to add to the revenue earned by their expensive grounds and stands.

Experiments were tried before the war. I remember witnessing a try-out on the Arsenal ground and a rugby league match at the White City, both played with the aid of floodlights and a white painted ball. I cannot say the experiments seemed entirely promising. However great the amount of artificial light used the peculiar conditions, and in particular the existence of a black sky overhead instead of a luminous white one, combine to make visibility at a distance difficult.

Then there is the weather. According to my recollection it was definitely foggy for the first test and misty for the second—evening mists are all too common during the football season. And it was *cold*.

All these circumstances lead me to the belief that if football or other sports are to be played for exhibition by night **the display should take place indoors**—in a covered stadium if one large enough can be built or obtained. This would enhance the comfort of spectators and largely overcome the weather difficulty. A suitable artificial surface underfoot could be kept dry and uniform in condition. From the lighting standpoint there would be the very great advantage of obtaining **a light background,**

against which the ball and players could be much more readily seen and a closer approach to natural conditions could be obtained.

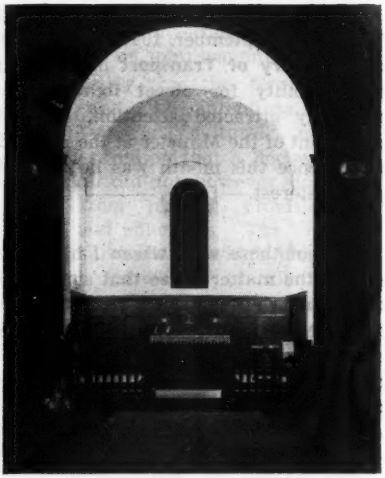
All this would be costly—but such an interior could be used for a number of events on the same day and the certainty of freedom from weather interference (how often in the winter does one hear the melancholy report, "Ground Unfit for Play"), would be well worth paying for.

My inquiry for information in regard to the use of **fluorescent lighting in churches** has brought a letter from Mr. L. C. Rettig, who agrees that this problem demands the exercise of considerable discretion—in fact, he states that of some 50 churches with which he has been connected during the past year, only one afforded suitable conditions for its use.

Mr. Rettig suggests that this type of lighting equipment is best applied when the throw is short and the equipment can be completely concealed, as in the lighting of the small sanctuary (approximately 15 ft. by 7 ft.) here illustrated. Concealment was effected by the chancel arch and by recessing a further pair of tubes into the narrow windows at the sides. The final result was much appreciated. The nave is lighted with tungsten lamps, and the difference in coloration helps to enhance the effect of the special chancel lighting.

Applications of fluorescent lamps in other situations, for example, **street lighting,** have been much discussed. In this connection the experimental lighting in Bond-street, London (illustrated on p. 187), is timely. Experts on street lighting believe that, in general, the very qualities that render fluorescent tubes so suitable for interior lighting, e.g., their low brightness and extensive surface area, unfit them for the treatment of traffic routes where relatively high illumination and concentration of light are needed.

In city streets, and especially in shopping areas, a better case for their use



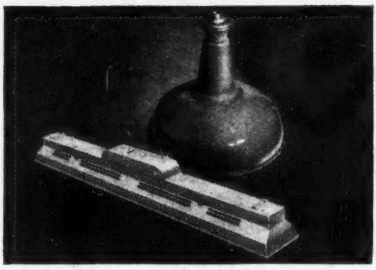
An example of the successful use of fluorescent lighting in a small Sanctuary designed by the Lighting Department of Messrs. H. R. Cleave and Co.

can be made out, though their full advantages would seem to be best gained on the assumption that they might be mounted on the surfaces of buildings lining the street, lamp posts being dispensed with.

There are, of course, many opportunities for outdoor lighting apart from the streets. One would imagine that in areas adjacent to buildings—passages, courtyards, etc.—and, of course, in connection with exhibitions the lamps could be utilised with advantage in the manner suggested above.

Who gave Vienna electric light opera?

Strangely enough, an Englishman—one of the great pioneers of electricity who, in 1883, carried out the first installation in the Vienna Opera House. The same man who spread the benefits of electricity from coal mines to the Himalayas, from Tilbury Docks to Buckingham Palace. His name? Colonel Crompton, founder of the firm of Crompton Parkinson Ltd. · This is the story of one of the earliest electric lighting installations—planned throughout by Crompton, just as many schemes with the most up-to-date lamps and lighting equipment are now planned by the team of technicians of the Crompton Lighting Service.



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The Concentrated-Arc Lamp

The Concentrated-Arc Lamp is a new type of light source which was developed during the war by the Western Union Telegraph Company of New York, and which has now been released for general sale.

Basically, it is an arc lamp provided with permanent electrodes, which are sealed into a glass bulb filled with an inert gas, the source of light being a small incandescent spot which forms on a specially prepared refractory oxide cathode. When the arc is established the oxide surface is raised to its melting point and a brilliant white light is emitted by the molten surface and a cloud of vapourised material, which extends for a few thousandths of an inch from the cathode. This vapour returns to the cathode, thus renewing its surface, so that the lamp has a life of several hundred hours.

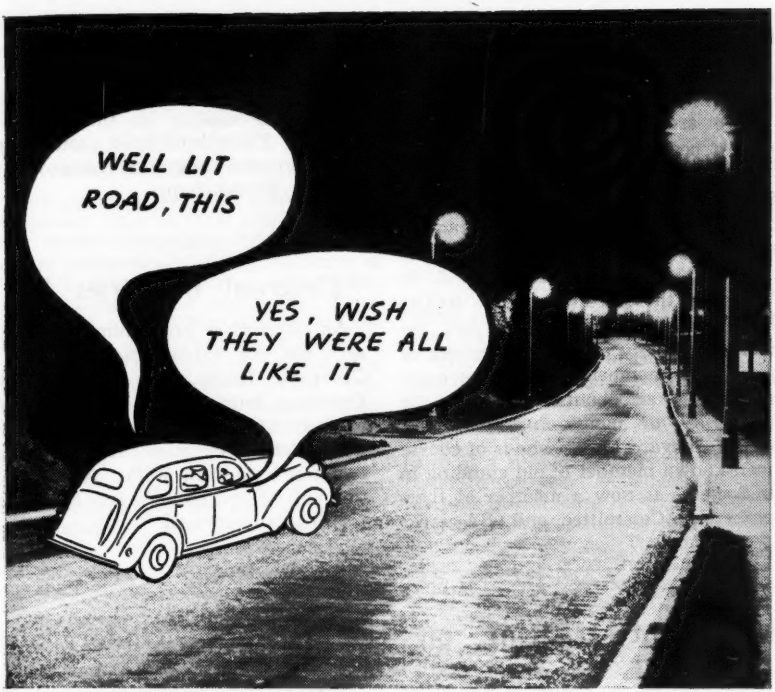
The light-emitting spot may be as small as 0.003 in. or as large as one-tenth of an inch in diameter, with brightnesses up to 65,000 candles per square in., i.e., about ten times that of the ordinary tungsten filament lamp and slightly less than that of the carbon arc lamp. These properties make the lamp useful for narrow-beam and high-intensity projection applications. In small sizes the lamps are a close approach to a point source and have applications in optical testing, lensless projection and enlargement, and photography.

The spot source appears to have a uniform and constant brightness, but measurements show the brightest part to be near the centre. Variations in the position taken by the arc stream and irregularities in the cathode surface may produce an unsymmetrical and changing brightness distribution across the spot, whilst, in addition, the spot position itself may change slowly during operation by an amount equal to a small percentage of its own diameter. These factors combine to produce variations of about 10 per cent. in the brightness and total emitted light, and though for most applications these effects are of no importance, for some special uses which require unusual stability they may have to be taken into consideration.

The spectral distribution of light from the lamp is similar to that from a tungsten filament lamp, but is several times brighter. Since the light originates from a point on the cathode surface, it is emitted in one hemisphere only, and has a cosine type of spacial distribution. The light is usually emitted from the side or the end of the bulb, though other arrangements are possible. On account of the extremely small diameter of the light source the glass bulbs must be unusually clear and free from striae and bubbles, which would cast heavy, sharp shadows, destroying the usefulness of the lamps in some projection applications.

The nominal ratings of available lamps are 2, 10, 25, and 100 W., and they operate on direct current requiring special circuits designed to meet their peculiar requirements. The lamps are started with a high voltage, to break down the arc gap, and are run from a well-filtered rectifier or a direct current generator or battery with sufficient ballast resistance in series to limit the current which might otherwise destroy the lamp. Two-watt lamps require 1,000 volts for starting and 130 volts or more for running, whilst larger lamps need up to 2,000 volts for starting, and may be run from sources supplying from 24 volts upwards, higher supply voltages resulting in more stable operation.

These lamps may be burned in any position, and are sufficiently strong to withstand normal shocks and blows which do not actually break the glass. For use in apparatus where position is important lamps are fitted with a prefocus base, of which there are two types, giving different degrees of pre-focusing accuracy.



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American I.E.S.

Applications for Membership

There are now quite a number of cases of people who are members both of the British and of the American I.E.S., chiefly, no doubt, because they appreciate the receipt of *Illuminating Engineering*, in which the Transactions of the American I.E.S. are embodied. It is possible, therefore, that some British I.E.S. members may wish to join the American Society either as members or as associate members, but do not quite know how to set about it. We take the opportunity of mentioning, therefore, that Mr. Howard Long (who is of course a well-known member of old standing in our Society) is now a member of their Membership Committee, and will gladly receive applications and issue the necessary forms to those wishing to join the Society in the United States. The formalities are quite simple, and such applications usually go through quite quickly. Those interested should apply to Mr. Howard Long (115, Hampton-lane, Solihull, Birmingham).

Electrical Industries Ball

An attractive programme has been arranged for Friday, November 8, at Grosvenor House, Park-lane, when the Electrical Industries Ball is being held on behalf of the Electrical Industries Benevolent Association (32, Old Burlington-street, London, W.1). Accommodation will be limited and early application for tickets is advised.

Fluorescent Lighting on the Glasgow Underground

Some months ago reference was made to the experimental Underground coach of the London Passenger Transport Board lighted with fluorescent lamps. Recently a similar experiment has been carried out on the Glasgow underground railway. Here a 250 v. single phase A.C. system is used for the coaches and standard fluorescent lamps may therefore be used.

Two coaches were fitted with 28 4 ft. daylight fluorescent lamps, 7 lamps being mounted on each side of the two coaches at about 6½ ft. from the floor. The consumption per coach is 560 watts, as compared with 640 for the previous tungsten lamp installation; 22 lumens per sq. ft., as compared with seven in the original installation, is provided.

Part of the installation, which was carried out by the Glasgow Transport Dept., under the direction of Mr. E. R. L. Fitzpayne, in consultation with the Glasgow branch of the G.E.C., is shown in the accompanying picture.

The A.P.L.E. Conference

(Held in London, September 10-12, 1946)

(Communicated)

That public lighting is now taking a recognised place in local administration was made abundantly clear at the annual conference of the Association of Public Lighting Engineers, which was held in London this year. Whilst the attendance at the 1945 Glasgow Conference was in the region of 800, this year some 1,000 delegates, representing 533 Local Authorities—together with many representatives of manufacturers of street lighting equipment—attended, and the meetings in the Central Hall, Westminster, were fully representative throughout. The exhibition, also held in the Central Hall, was even more fully representative than last year, and served to show that the manufacturers of street lighting equipment are getting into their stride again.

The M.O.T. and Public Lighting

Additional importance attached to this year's conference from the fact that the Ministry of Transport has now become the Central Authority responsible for street lighting, and that co-ordinated plans are being prepared to deal with the whole problem on organised lines. The precise nature of those plans is naturally not known as yet, but no doubt their influence on public lighting will be considerable. This was made clear when the Minister of Transport—the Rt. Hon. Alfred Barnes, M.P.—opened the conference and the exhibition on the morning of September 10, when he not only urged the Association, as representing public lighting authorities, to co-operate to the fullest extent with the Ministry's engineers, but showed knowledge of the many problems involved, and of the preparatory work being done "behind the scenes."

Two outstanding points brought out during the conference, and by the Minister's speech, were the need for uniformity of visibility as distinct from illumination, and the possibility—if not more—of dividing the country into regions for the purposes of street lighting. This latter proposal has inevitably brought some criticism on the part of representatives of local authorities and the expression of their desire to retain as much local autonomy as possible. The difficulties of finance, however, make it obvious that a large measure of co-ordination is essential if anything approaching uniformity is to be achieved.

Of special interest is the fact that the conference was attended by representatives from the United States, Australia, France, Holland, Denmark, and Sweden, and it is understood that but for the difficulties of transport, other representatives from abroad would also have been present.

In the afternoon of September 10, an extraordinary general meeting was held at which the modifications to the Articles of Association, which were discussed at great length at Glasgow last year and also at a subsequent meeting in London later in the year, were adopted. These include an increase in subscriptions and a general strengthening of the position of the Association. The changes have been sanctioned by the Board of Trade and take effect immediately.

The annual general meeting of the Association followed, when it was seen that the finances are in a satisfactory state. Mr. W. N. C. Clinch (manager, Northmet Power Co.) is the new president, and Mr. Thomas Wilkie (lighting engineer, Leicester) is the vice-president. Mr. J. F. Colquhoun (Sheffield) drops out of the council and four vacancies were filled by the re-election of Mr. E. C. Lennox (Newcastle-on-Tyne), Mr. A. S. Tapsfield (City of London), and Mr. Robert Lee (St. Pancras), and the election of Mr. E. Howard (Nottingham).

The Presidential Address

The proceedings so far had been under the conduct of the retiring president, Mr. E. J. Stewart (Glasgow), who, as we stated last year, has carried the burden of the office throughout the war years, but at the close of the annual general meeting he handed over to his successor, Mr. Clinch, who delivered his presidential address, after well deserved compliments had been paid to the retiring president, and to the new president for his work for the Association.

The president opened his address with the pertinent remark that public lighting, like all services to the community,

comes in for more criticism than congratulation. He gave a brief story of lighting in streets from the days of the link boys to the present time and stressed the recommendations in the final report of the committee of the Ministry of Transport in 1937, drawing special attention to the recommendation that there should be reasonable uniformity in the lighting of portions of traffic routes presenting similar characteristics. This "reasonable uniformity," he said, is still too infrequent, but it was inseparable from the fourth recommendation of the committee that "adjoining authorities should confer together with the object of securing uniformity of lighting on routes of common interest." Again, there was the committee's conclusion that "the present system of administration is not conducive to the achievement of uniform and effective lighting of traffic routes and consideration should be given to the responsibility for the lighting of traffic routes being confined to large administrative units, and to the suggestion that the cost of lighting roads should be aided by grants from national funds and administered by the responsible Government Departments."

The President felt there can be little disagreement on these matters or with the proposal that the Committee's recommendations should be implemented by the issue, with the minimum of delay, of a formal specification. He expressed the hope that the realisation of the short distance we have travelled towards the fulfilment of these recommendations since 1935—when the interim Report of the Committee was issued—should spur us on to greater effort for the common good.

Stress was laid on the inability of the smaller authorities to implement these recommendations due to lack of the necessary finance, and the President felt that until the recommendation that the cost of lighting should be aided by grants from National Funds administered by the responsible Government Department has been adopted, we are at a standstill in securing the measure of uniformity which is essential for public safety. Stress was, at the same time, laid upon the appalling loss of life and injury as the result of street accidents and the President urged local authorities not to tie themselves too harshly to the mercenary cost but rather to the safeguard which, by their active interest, can make possible the saving of lives. Of course, responsibility for street accidents did not, in itself, reflect only upon those responsible for street lighting. The actions of people were at times thoughtless and ill-considered, and in the training which the Vice-President, Mr. Wilkie, had much in mind, there must be consideration of the habits and ways of people as well as the consideration of technicalities. He added that public lighting does not only cover the lighting of traffic routes but also embraces the lighting of footways for more specific purposes. There was a vast field for investigation here.

Finally, the President gave a brief account of the activities of his company in regard to street lighting, pointing out that privately, industrially, and for public lighting it catered for the needs of more than one million people. His company has a Standing Committee on Street Lighting comprised of its engineers responsible for public lighting under the chairmanship of the engineer at headquarters. This Committee meets monthly, and the aim is that tenders for public lighting schemes shall, so far as it lies within the company's power, follow the recommendations of the M.O.T. Report.

There was a cordial vote of thanks for the Presidential Address, and in the evening the President held a reception at Connaught Rooms which was very largely attended. Indeed, it was a matter of regret to the President and his company that almost as many applications for invitations had to be refused as the number of invitations it was possible to issue, owing to present-day restrictions. Those who were fortunate enough to receive invitations had a happy time, and were profuse in their appreciation of the evening's entertainment and hospitality.

The Conference reassembled in good heart on Wednesday morning, September 11, when two papers were read and discussed.

Administrative Problems.

The first was by Mr. E. C. Lennox, of Newcastle, and it was entitled "Public

Lighting—Administration." A few of the pros and cons of the problem of whether some form of central administration of public lighting should be established were put forward, but the author, having weighed these factors, was evidently "all for it." He deprecated the parochial outlook, called attention to the inability of the small urban, rural, and parish councils adequately to light the main roads running through their areas, and gave a table of the mileage and cost of lighting to Grade A of a certain through-traffic route with which he is familiar. Taking all the authorities concerned—and there are 22—he showed that the product of a rate of 1d. in the £ varied from £11,000 in the case of Newcastle to £3 in the case of one of the parish councils, yet the main road runs through all the 22 areas. It was also shown that on the present basis of administration the annual rate required to carry out this Grade A lighting along the whole length of the particular road would vary from 148d. in the £ in a certain parish council to 0.08d. in the £ in the case of Newcastle.

Strongly advocating a Central Administration, Mr. Lennox asked where the necessary finance was to come from, and answered his own question by suggesting that the lighting of such main roads should be carried out on the same lines as those adopted for the provision and maintenance of main roads. The burden of the cost of lighting would then become a matter for payment from national funds for the trunk roads, County or County Borough funds for the next most important roads, and parochial funds for the least important streets or roads, the provision and maintenance of lighting for the latter types of roads being subject to the same grants as are now made by the Ministry of Transport in connection with road maintenance.

Premising that the objection which could be raised against this proposal is that the richer areas would find the cost of lighting a much less burden than that of the more rural administrative unit, he said an alternative procedure could be that the present administration should obtain grants from a national source for the better lighting of the administrative area. Surely no better fund existed than the Road Fund set up many years ago by way of direct taxation of motor vehicles, to be administered for the construction and maintenance of adequate roads to meet increasing traffic conditions. In either case, it is presumed that grants from national funds would not be allowed without some measure of control, presumably regional control, thereby ensuring proper advice in connection with the individual schemes.

There was a good discussion on the paper, although here and in some other discussions the elected representatives of the local authorities were rather prone to speak at excessive length.

The discussion revealed a natural objection on the part of the members of councils to hand over any of the lighting powers they now possess—a feature that has manifested itself in connection with many schemes of reorganisation of public services under the present Government. Even confessed supporters of the Government objected to what they termed "bureaucracy from the top," but were sympathetic towards the co-operation of the neighbouring small authorities with the larger towns and cities which they adjoined. All were concerned about the problem of finance, although one representative of a large city—Manchester—based hopes on the taxation of land values as a source of revenue, whilst others were disposed to hope that the problem would ultimately solve itself. The clerk of one Rural District Council strongly claiming that his authority was progressive—it has a good deal of industry in it—complained strongly that although they wanted up-to-date lighting and were willing to pay for it, the inability of the County Council and a large neighbouring borough council to agree had led to stagnation. This is a type of case which will certainly be dealt with under a regional or some similar scheme.

A defence of our present street lighting, in view of limited funds, was put up by Councillor Hebden of Shoreditch, who claimed that the large number of second-hand vehicles on the roads was more responsible for street accidents than inefficient lighting. His main point was that central control would lead to a stultification of ideas on the part of those locally concerned. It was

suggested by Alderman Kegie of Gateshead that the Association should set up some advisory committee to advise the Ministry of Transport, and several speakers urged that definite action should be taken on the basis of the paper.

Organisation, Staff and Training

There followed a paper on "The Public Lighting Engineer; His Organisation, Staff, and Training, with Postscript to Councillors," by Mr. Ronald Parker (Superintendent of Lighting, Aberdeen). This set out in considerable detail the fundamental requirements of a public lighting department organisation and described the scheme which has been adopted at Aberdeen. The basic organisation outlined was considered sufficiently flexible to allow of its application to any full-scale lighting department. In the case of relatively small departments, the functional requirements of the large department would still exist, but it might be necessary to combine sections. It was strongly emphasised that the whole department *must* be under the control of the lighting engineer and that he would be responsible to no one but the committee charged with street lighting matters for his area.

The scheme includes a technical section, a workshops section, lamp lighting and cleaning section, and an administrative section. The qualifications of personnel were also discussed. Finally, in his "Postscript to Councillors," the author drew attention to a recommendation in the M.O.T. Committee's Report on the necessity for the appointment of a competent lighting engineer, and said that a review of recent advertisements of street lighting vacancies suggested a regrettable lack of knowledge of the qualifications which should be sought in such officials.

The discussion revealed that members of lighting committees agreed that men with the highest qualifications, paid adequate salaries, should be appointed. The main point arising from it was a suggestion by Mr. R. F. Brooks Grundy, engineer at Wallasey, that the Association should take immediate steps to introduce its own examination scheme for qualification as public lighting engineers.

The Motorists' Outlook

The afternoon session on September 11 was a relatively short one, there being only one paper in order to enable the delegates to make a close inspection of the exhibition. This paper was by Mr. Edward Fryer, secretary of the Automobile Association, and it was entitled "Street Lighting from the Motorists' Point of View." It was, perhaps, necessarily of a general character, and in presenting it the author—although not mentioning it in the printed text—made great play with the advantages of the lighting of the Mersey Tunnel. It was pointed out, however, that the conditions here are very different from those of an open road. For instance, in the Mersey Tunnel there is no chance of a pedestrian suddenly stepping into the roadway, the lighting is all carried out from the roof of the tunnel, and there is no chance of a wet surface.

The view was expressed by the author that the lighting of main trunk roads throughout their continuous length was hardly to be expected at the present stage, but his whole plea was for adequate visibility in built-up areas with some control of confusing lights such as a strong light at intersections on an otherwise unlighted road, advertisement lighting and other matters of this kind with which the motorist is, unfortunately, only too familiar. These came under the heading of distracting lights. Some comments were also made on background lighting on which lighting engineers themselves have more than one opinion, but Mr. Fryer favoured the lighting, in some form, of footpaths.

In the discussion, Mr. H. Midgley, who was at one time concerned with the lighting of the Mersey Tunnel, said the efficiency of a street lighting system could only be judged adequately under wet conditions and for that reason he expressed the hope that it would rain later that evening when the delegates toured some of the London lighting installations. (But it did not!) Mr. L. T. Minchin agreed with the author as to the need for background lighting, and Mr. S. J. Scudamore (City Engineer, Gloucester), expressed the hope that the system adopted in his city of using mercury discharge lighting for through routes and sodium discharge lighting

for others would be adopted in other cities than his. This difficulty of a driver finding his way through a town was stressed by other speakers the point being made that a town at night, although quite familiar to a driver in the day, took on a very different aspect. It was suggested that the aim should be to make a town look the same by night as it did by day. Councillor Reid, of Aberdeen, thought it would be a good idea to light the left hand side of a main road with a different colour lighting from the right hand side to assist drivers in keeping to the main road and not turning of inadvertently. Mr. Allpress did not think the continuous lighting of trunk roads need be regarded as a matter for the very distant future and urged the Council to prepare an ambitious programme. He also emphasised the need for unity of ideas among lighting engineers at this moment having regard to the possibility that the Association would be called in to assist in the preparation of the Government's scheme for lighting roads for the future. He advocated the greater use of cut-off fittings. On this point the president said that as a motorist he was very perplexed by cut-off fittings when driving at night, although he understood that bus drivers had no such difficulty.

Modern Gas Lighting

On Thursday morning the conference devoted itself to a comprehensive paper by Mr. Crawford Sugg on "The Quality of Public Lighting Installations and the Modern Use of the Gas Source." The hope of the author was that his paper would help in the practical interpretation of the term "quality of the lighting installation," reference to which was made in the new B.S. draft specification. He recalled various papers on the evaluation of the revealing power of street lighting installations had been expertly dealt with in previous paper before the Association and also the Illuminating Engineering Society—naming in this connection Messrs. Dunbar, Waldram, and Smith, and said that the unfortunate gap between the research laboratory and the road was the prime reason for his introduction of a warning against the use of lumen figures in the draft specification, and the continued need for the lighting engineer to apply imagination and skill to the planning of installations if he is to achieve a result really worthy of his efforts and not one which barely satisfies the requirements of the specification.

He emphasised that discharge sources of lighting pulsate in step with the alternating current with which they were supplied, leaving the duty of smoothing these pulsations into an apparently steady light to the eyes by virtue of the phenomenon known as "persistence of vision." In the absence of evidence to the contrary, however, it would appear reasonable to suppose that a pulsating excitation of the optical nerves must tire them more than a comparatively steady excitation. For this reason, gas, which was completely independent of this and other difficulties associated with electric lighting, must have much to commend it.

In this connection, i.e., comparing electricity with gas generally, he said that more recently, and with a tendency to the general dependence on the use of lumen figures as a too easily grasped yardstick for the assessment of lighting, there had been a lack of appreciation especially of the high light utilisation of gas street lighting equipment, which was penalised on the total luminous output basis by its own high efficiency of light distribution. It was to be hoped that this would be corrected by the draft specification and by other changes in the methods of assessing installations. The traditional competition between gas and electricity would then be placed on a sounder footing.

Mr. Sugg then indicated the developments that have taken place, and others in hand, in gas street lighting equipment and illustrated and described a number of apparatuses, which were to be seen in the exhibition. The paper aimed only at stressing some of the principal factors which provide good lighting. There were, said the author, others which many lighting engineers might consider just as important which, at some future conference, might form the subject of another paper. For instance, there had been no opportunity to discuss the use of high pressure gas for street lighting, a subject which required a paper all to itself.

There was a long discussion on the paper. Dr. J. W. T. Walsh (N.P.L.), dis-

cussed the paper with his usual charm from the purely scientific aspect. He agreed that the lumen output from street lighting lanterns is only one of many factors contributing to the quality of street lighting but could not go "anywhere" with the author as to the effect of pulses in the case of electric lighting. In his view, there was no effect—on the evidence available—such as that indicated by the author.

Dr. S. English and others paid high tributes to the great developments that were indicated in gas lanterns in the author's descriptions and illustrations, and stress was again laid on the importance of uniformity of vision rather than uniformity of illumination, the point being made that what would be an extremely good installation from the point of view of visibility under some conditions would be perfectly intolerable under others. The importance of designing installations with a view to ease and economy in maintenance was also the subject of comment.

Mr. J. A. Prowse presented data bearing on the comparative cost of gas and electric lighting. Dr. Hopkinson challenged the view that inconvenience could be caused by the pulsation of discharge lamps, and Mr. W. J. G. Davey described and illustrated a new lantern for gas lighting embodying certain advanced principles which it had not been possible to embody in the paper. Mr. E. Stroud thought the street lighting problem was largely a question of having enough light, and that street lighting engineers should have a freer hand in this respect.

Fluorescent Street Lighting

On Thursday afternoon, Messrs. L. J. Davies and W. D. Sinclair gave a lecture, with illustrations and demonstrations, on "Experimental Applications of Tubular Fluorescent Lamps to Street Lighting." The work described had been carried out by the B. T-H. Research Laboratory at Rugby in association with the Central London Electricity, Ltd., and the Rugby Corporation.

The main part of the paper described two experimental road installations—admittedly on unorthodox lines—one in Bond-street, London, which the delegates had had the opportunity of inspecting, and the other in Rugby. Appreciation was expressed of the continual encouragement given throughout the work by the two authorities mentioned. Having seen the Bond-street installation the delegates were all agreed with the authors' statement that the high background brightness of a pleasant colour maintained on the pavement and buildings with low glare, provided for pedestrians and motorists a useful attractive lighting of a very high order, although there was no opportunity of seeing Bond-street under wet conditions. The authors' experiments, however, have been tested under these conditions and their claim is that such results are obtained under both wet and dry conditions.

The authors dealt in considerable detail with lantern design, cold weather behaviour, colour and efficiency, and variation of light output with mains voltage. The experimental work is continuing and further improvements are confidently anticipated. Considerable work of a similar character has been carried out in America and the conclusions arrived at there are outlined in the paper. There was no attempt to disguise the fact that this new method of lighting streets is in its early stages and the authors emphasise that their experiments to date must not be taken as a recommendation by them to abandon present methods.

In the discussion it was agreed that the authors have made a considerable contribution to the science of public lighting engineering. Mr. T. Wilkie (Leicester) even went so far as to say that he thought the light from the Rugby installation was not only good but too good! Economics naturally were referred to as well as the limitations of such a system to shopping centres, etc., and a desire was expressed for further experimental installations. These were, in fact, promised and Mr. Leach, of Central London Electricity, Ltd., said that whilst it was still desirable to make many more readings and generally to improve and develop, he had every confidence that on the economic side it would eventually be possible to light streets with the system described as cheaply as with any other form of lighting, and obtain a better

light. Obviously, however, there was much yet to be done.

A Resolution

At the conclusion of the Conference, the following resolution, arising out of comments made at various times during the Conference discussions, was unanimously agreed to:

"That this Conference of the Association of Public Lighting Engineers, comprising members of more than 500 local authorities and their lighting engineers, instruct our Council to make early representations to the Ministry of Transport in order that the many urgent problems of street lighting may be thoroughly discussed."

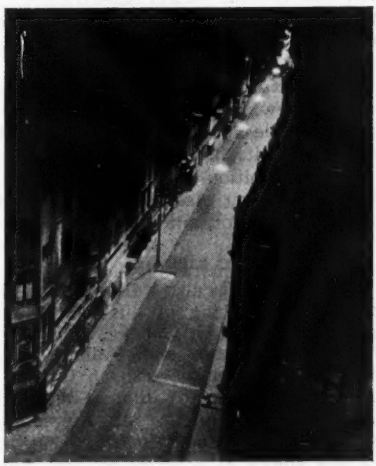
The Conference Luncheon

The Conference Luncheon was held at the Connaught Rooms on Thursday, September 12, the principal guest being the Rt. Hon. W. S. Morrison, K.C., M.P. Mr. Morrison proposed the toast of the Association and spoke in terms of commendation of its work, with a special word of appreciation of the President, Mr. Clinch. He expressed the view that public lighting is now coming into its own and emphasised the important part it can play in reducing the toll of road accidents. At the same time he pointed to the responsibilities in this connection of the road surveyor, the pedestrian and the motorist. He caused some amusement when he recalled the Decree in London many years ago that every citizen should hang a lantern outside his house during the hours of darkness, but it was not stated that the lantern should be lighted! The result was that unlighted lanterns were hung out until the Decree was altered. He gave a brief general history of the development of lighting from the oil lamp. The President responded to the Toast, and urged the members of the Association, through the Council, to be objective in their desires and in their achievements. Responding to the toast of "The Guests," proposed by Mr. Robert Lee (St. Pancras), an encouraging speech was made by Sir Charles Brassey who, in his usual forthright manner, urged public lighting engineers, especially in dealing with the new satellite towns, to do away, as soon as possible, with posts, and strike out in new directions for their street lighting.

New Lighting in Old Bond Street

An event of considerable interest in connection with the A.P.L.E. Conference was the lighting of Old Bond-street (London) with 5-ft. 80-watt fluorescent lamps. The installation was described in the paper read at the conference by Mr. L. J. Davies, to which we hope to make fuller reference in a coming issue.

For the moment we present the accompanying striking view, taken from a balcony in Piccadilly. The special lanterns housing the tubes are mounted 25 ft. high and are suspended on catenary wires at 80 ft. intervals. This novel and enterprising installation was planned and designed by the British Thomson-Houston Co., Ltd., on behalf of Central London Electricity, Ltd.



A view of Bond Street, London, illuminated by fluorescent tubular lamps.

Modern Street Lighting

Exhibits at the A.P.L.E. Conference

In addition to the account of the proceedings at the recent A.P.L.E. Conference in London which is given elsewhere in this issue (see pp. 181-7) it may be of interest to put on record a list of the exhibitors. Nearly 40 firms were represented, a number somewhat exceeding that at the conference held during the previous year in Glasgow. For convenience the exhibits are grouped into five sections.

Electric Street Lighting

Amongst the outstanding firms dealing with electric street lighting lanterns were: The Brighton Lighting and Electrical Engineering Co., Ltd.; The British Thompson Houston Co., Ltd.; The Edison Swan Electric Co., Ltd.; The Electric Street Lighting Apparatus Co., Ltd.; The Engineering and Lighting Equipment Co., Ltd.; Falk, Stadelmann and Co.; The General Electric Co., Ltd.; Holophane Ltd.; Metropolitan Vickers Electrical Co., Ltd.; Philips Lamps Ltd.; Revo Electric Co., Ltd.; and Siemens Electric Lamps and Supplies, Ltd.

A very extensive selection of lanterns was on view, including some new designs, and the application of fluorescent lamps made its first appearance at the A.P.L.E. exhibition. The British Electrical Development Association also had a stand and information bureau.

Gas Lighting

Gas lighting was also well represented, the firms exhibiting in this connection being William Edgar and Son Ltd.; Elm Works Ltd.; Foster and Pullen Ltd.; Lighting Trades and Welsbach Ltd.; W. Parkinson and Co.; William Sugg and Co.; and Willey and Co. An interesting exhibit was the Sugg "8,000" lamp with the new Sugg C.U. concrete bracket, containing all the controls, which is of very pleasing appearance and has been designed for completely new gas street lighting installations.

Accessories

Firms dealing in lighting columns were well represented by Broad and Co., Ltd.; Concrete Utilities Ltd.; Poles Ltd.; The Stanton Ironworks Co., Ltd.; Stewarts and Lloyds and Spun Concrete Ltd. Gowshall Ltd. had an interesting display of internally illuminated traffic signs and pedestrian crossing beacons.

Another group was that dealing with time switches and other direct control apparatus as shown by the British, Foreign and Colonial Automatic Light Controlling Co., Ltd.; the Horstmann Gear Co.; Sangamo Weston Ltd.; and Venner Time Switches Ltd.

Systems of remote control for street lamps were shown by the Automatic Telephone and Electric Co., Ltd.; Measurement Ltd., who demonstrated their "Actadis" ripple control equipment; the Record Electrical Co., Ltd.; and Standard Telephones and Cables Ltd.

It is too soon after the war years to expect any great advances in the design of street lighting equipment, but there are already indications that firms are planning for the future and that more public lighting equipment is becoming available.

Amongst the interesting exhibits might be mentioned a demonstration by the G.E.C. of the optical system of their "Dioptrion" lantern for horizontally burning mercury vapour lamps and a display of "Bleeco" floodlighting projectors for use in illuminating public buildings. Of general interest to firms interested in gas or electric street lighting equipment was the exhibit by the Association of Metal Sprayers, which showed methods of protecting metal parts against corrosion.

The display was well arranged, the only drawback being the crowding of space available owing to the large attendance—it is understood that there were over 1,000 visitors daily at the exhibition. More space would have been of benefit to facilitate the viewing of the various stands.